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मानक

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IS 15612-4 (2005): Textiles - Burning behaviour of curtains and drapes, Part 4: Method for determining the flame spread of vertically oriented specimens [TXD 32: Textiles Protective Clothing]



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भारतीय मानक
वस्त्रादि — पर्दों और ड्रैपों का ज्वलन व्यवहार
भाग 4 टंगे नमूनों की ज्वलनशीलता ज्ञात करने की पद्धति

Indian Standard

TEXTILES — BURNING BEHAVIOUR OF
CURTAINS AND DRAPES
PART 4 METHOD FOR DETERMINING THE FLAME SPREAD OF
VERTICALLY ORIENTED SPECIMENS

ICS 13.220.40;59.080.30

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

FOREWORD

This Indian Standard (Part 4) was adopted by the Bureau of Indian Standards, after the draft finalized by the Chemical Methods of Test Sectional Committee had been approved by the Textile Division Council.

The flammability is one of the important properties of textile materials apart from other characteristics such as combustion, thermal degradation, smouldering, after glow, smoke and toxicity. With the increasing awareness of fire hazards and promulgation of fire safety rules and regulations in several advanced countries, development of standards on burning behaviour of textiles needs no emphasis.

In order to keep pace with the technological advances in the testing of burning behaviour of textile fabrics intended for curtains and drapes, and similar uses such as drapes and hangings, formulation of standards based on latest practices at International level is essential.

The Part 4 of this standard is based on EN 1102 : 1995 'Burning behaviour of curtain and drapes — Detailed method of determining the flame spread of vertically oriented specimens'. The ignitability is determined in accordance with IS 15590 : 2005/ISO 6941 with some modification which are specified in this standard.

The other parts in this series are:

- Part 1 Classification scheme
- Part 2 Measurement of flame spread of vertically oriented specimens with large ignition source
- Part 3 Method for determining the ignitability of vertically oriented specimens (small flame)

The composition of the Committee responsible for formulation of this standard is given in Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounding off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***TEXTILES — BURNING BEHAVIOUR OF
CURTAINS AND DRAPES****PART 4 METHOD FOR DETERMINING THE FLAME SPREAD OF
VERTICALLY ORIENTED SPECIMENS****1 SCOPE**

This standard (Part 4) specifies a procedure to determine the flame spread of textiles for curtains and drapes by testing a vertically oriented specimen in accordance with IS 15590.

2 REFERENCES

The following standards contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<i>IS No.</i>	<i>Title</i>
15370 : 2005/ ISO 6330 : 2000	Textiles — Domestic washing and drying procedures for textile testing
15590 : 2005/ ISO 6941 : 1984	Textile fabrics — Burning behaviour — Measurement of flame spread properties of vertically oriented specimens.
15612 (Part 2) : 2005	Textiles — Burning behaviour of curtains and drapes: Part 2 Measurement of flame spread of vertically oriented specimens with large ignition source

3 DEFINITIONS

For the purposes of this standard, the following definitions shall apply.

3.1 Attendant Fire Phenomena — Special phenomena occurring during burning, such as, flaming debris, darting flames, formation of sparks.

3.2 Flaming Debris — Material separating from the specimen during the test procedure, falling below the initial edge of the specimen and igniting a filter paper.

4 SAMPLING

Samples shall be representative of the materials as used in complete curtains and drapes, in accordance with the number and size of the specimens specified in IS 15590.

5 CLEANSING

5.1 The sample shall be submitted to the cleansing procedure given on the care label. If no cleansing procedure is prescribed, the material shall be submitted to one cycle of one of the following standard cleansing procedures as appropriate to the fabric:

- a) washing in accordance with method 6A (40 ± 3)°C and drying in accordance with method C specified in IS 15370; and
- b) dry cleaning in accordance with Annex C of IS 15612 (Part 2).

5.2 If the fabric is not intended to be cleansed, testing shall be carried out on samples and specimens as received.

NOTE — This cleansing procedure is not intended as a durability test for flame retardant treatment but only to remove non-durable finishes or contamination and to obtain fabric surfaces and structure characteristics which are representative of those typically obtained in fabrics in actual use.

6 TEST SPECIMENS

6.1 Test specimens shall be cut from the sample as described in 4.

6.2 The specimens shall consist of one or more layers of material, according to the construction of the curtain.

6.3 Unless otherwise specified, specimens shall not contain features such as seams, pleats, etc. Nevertheless, specimens shall contain pattern or design features when they are a specific part of the fabric, such as Jacquard construction.

7 CONDITIONING

Condition the specimens and the filter paper for at least 24 h in a standard atmosphere of 27 ± 2 °C and 65 ± 2 percent relative humidity.

8 TEST PROCEDURE**8.1 Spread of Flame**

Spread of flame shall be tested according to IS 15590 using commercial propane gas and adopting the following

modifications:

- a) the flame application time shall be 10 s;
- b) only the first and the third marker thread shall be used;
- c) the marker threads are to be spun from pure cotton with a linear density of 45 ± 5 tex.

8.2 Attendant Fire Phenomena Assessment

The attendant fire phenomena shall be assessed using the apparatus described in IS 15590 during the procedure used to determine the flame spread.

8.3 Procedure for the Evaluation of Flaming Debris

8.3.1 Position horizontally, below the specimen, at a distance of 50 mm from the lower edge of the specimen on a flat surface, a piece of filter paper of at least 150 mm × 100 mm, with the following characteristics:

- a) Mass per unit area: 68 ± 6 g/m²;
- b) Thickness: 0.15 mm to 0.16 mm; and
- c) Content of alpha cellulose: ≥ 95 percent.

8.3.2 Note whether the filter paper ignites or not.

8.4 Flame Spread Rate Calculation

The flame spread rate, V , in mm/s, shall be calculated using the following equation:

$$V = 300 / (t_3 - t_1)$$

where

- t_1 = time from the start of the application of the ignition flame to the severance of the first marker thread, in seconds; and
- t_3 = time, from the start of the application of the ignition flame to the severance of the third marker thread, in seconds.

9 TEST REPORT

The test report shall include the following information:

- a) Reference to this Indian Standard;

- b) Identification of the fabrics tested;
- c) Cleansing procedure if used or, a statement that the material is not intended to be cleansed;
- d) Date of testing;
- e) Ambient conditions (temperature and relative humidity) in the area in which the test is carried out;
- f) Techniques used to attach fabrics which cannot be supported on pins;
- g) Orientation of the burner used for igniting the specimen, edge or surface ignition;
- h) Following times, in seconds, for the length and the width directions and for each face tested:
 - i) the flame spread time(s) measured in accordance with 8.9, items (a) and (c) of IS 15590; and
 - ii) if six specimens are tested, the mean from the results of each direction for all the specimens that burn to the respective marker thread, and the number of mean values for each direction;

NOTE — Do not report a mean of less than three values.

- j) Flame spread rate, in mm/s, for all specimens giving severance of the third marker thread;
- k) If six specimens are tested, the mean from the results of all the specimens of each direction;
NOTE — Do not report a mean of less than three values.
- m) Number of specimens that failed to ignite;
- n) Number of specimens which ignited but failed to burn the first marker thread;
- p) Result of the attendant fire phenomena assessment or a statement that no such assessment was made; and
- q) Any deviation from this procedure.

ANNEX A (Foreword)

COMMITTEE COMPOSITION

Chemical Methods of Test Sectional Committee, TX 05

<i>Organization</i>	<i>Representative(s)</i>
Textiles Committee, Mumbai	DR G. S. NADIGAR (<i>Chairman</i>) SHRI E. VISHAMBHARAM (<i>Alternate</i>)
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Sunil Industries Ltd, Mumbai	SHRI VINOD G. LATH SHRI RAMESH KHANNA (<i>Alternate</i>)
Textiles & Engineering Institute, Ichalkaranji, Distt Kohlapur	PROF S. K. LAGA PROF S. S. CHINCHWADE (<i>Alternate</i>)
The Bombay Millowners' Association, Mumbai	SHRI MAHESH SHARMA
The Bombay Textile Research Association, Mumbai	SHRI A. V. AFFINI SHRI B. S. ACHARYA (<i>Alternate</i>)

IS 15612 (Part 4) : 2005

<i>Organization</i>	<i>Representative(s)</i>
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BIS Directorate General	SHRI M. S. VERMA, Director and Head (TXD) [Representing Director General (<i>Ex-officio Member</i>)]

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Joint Director (TXD), BIS

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